

WHAT IS CLAIMED IS:

1. A thin film magnetic head comprising:
  - a lower magnetic pole layer extending rearward from a front end exposed at a medium-opposed surface;
  - a depression located on an upper surface of the lower magnetic pole layer;
  - a lower auxiliary magnetic pole defined in the lower magnetic pole layer between the medium-opposed surface and the depression;
  - a non-magnetic mass embedded in the depression; and
  - an upper magnetic pole opposing a front end to the lower auxiliary magnetic pole at the medium-opposed surface.
2. The thin film magnetic head according to claim 1, wherein said non-magnetic mass is made of a resin material.
3. The thin film magnetic head according to claim 1, wherein said non-magnetic mass is made of a non-magnetic metallic material.
4. The thin film magnetic head according to claim 1, wherein said lower magnetic pole layer is made of a nitride.
5. The thin film magnetic head according to claim 1, wherein said lower magnetic pole layer is made of a composite material comprising a magnetic material and an oxide.
6. A method of making a thin film magnetic head, comprising:
  - forming a lower magnetic pole layer;

forming a depression on a surface of the lower magnetic pole layer so as to define a rear end of a lower auxiliary magnetic pole; and

filling the depression with a non-magnetic material.

7. The method according to claim 6, comprising:

forming a resist film defining a shape of the depression on the surface of the lower magnetic pole layer; and

subjecting the lower magnetic pole layer to an ion milling process so as to form the depression.

8. The method according to claim 6, comprising:

filling the depression with a resin material as the non-magnetic material;

forming a protection film over the surface of the lower magnetic pole layer; and

subjecting an exposed surface of the protection layer to a flattening process so as to expose the resin material in the depression.

9. The method according to claim 6, comprising:

forming a non-magnetic metallic film over the surface of the lower magnetic pole layer so as to fill the depression with the non-magnetic material of the non-magnetic metallic film; and

subjecting an exposed surface of the non-magnetic metallic film to a flattening process so as to expose the surface of the lower magnetic pole layer around the depression.

10. The method according to claim 9, wherein electrolyte plating or non-electrolyte plating is employed to form the non-magnetic metallic film.

11. The method according to claim 10, wherein said non-magnetic metallic film includes at least one material selected from a group consisting of Cu, Ag, Au and Pt.

12. A thin film magnetic head comprising:

a lower magnetic pole layer extending rearward from a front end exposed at a medium-opposed surface;

a non-magnetic region defined in the lower magnetic pole layer at a position spaced rearward from the medium-opposed surface on the basis of a non-magnetic element doped within the lower magnetic pole layer;

a lower auxiliary magnetic pole defined in the lower magnetic pole layer between the medium-opposed surface and the non-magnetic region; and

an upper magnetic pole opposing a front end to the lower auxiliary magnetic pole at the medium-opposed surface.

13. A method of making a thin film magnetic head, comprising:

forming a lower magnetic pole layer; and

doping a non-magnetic element ion into the lower magnetic pole layer so as to define a rear end of a lower auxiliary magnetic pole.